



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,348	01/05/2004	Takayuki Morita	4041J-000824	2218

27572 7590 04/11/2006

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

BANKHEAD, GENE LOUIS

ART UNIT	PAPER NUMBER
----------	--------------

3744

DATE MAILED: 04/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/751,348		MORITA ET AL.	
	Examiner		Art Unit	
	Gene L. Bankhead		3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 9-13 is/are rejected.
- 7) ☒ Claim(s) 6 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/05/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>01/05/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in Application No. 10751348, filed on January 05, 2004.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim(s) 1 is rejected under 102(b) as being anticipated by Bednarchik (US 6427465). Bednarchik discloses a freezing prevention system with a refrigerant compressor (50) and refrigerant evaporator (18) and a temperature detection unit (71) disposed in the refrigerant evaporator. Bednarchik further discloses a control unit (column 3 lines 54-55), with an integral calculating means (column 4 lines 43-55), that stops the operation of the compressor when the integral value calculated by the calculating means becomes equal to or larger than a predetermined value (column 4 lines 63-67).

With regard to claim 2 Bednarchik discloses that the temperature detection unit (71) is a temperature sensor (column 3 lines 59-62), and Figure 1 shows the temperature sensor disposed on the surface of the refrigerant evaporator. Based on the disclosure and Figure 1 of Bednarchik it is inherent that the temperature detection unit detects the surface temperature of the refrigerant evaporator. Note the detecting of the "evaporator fin temperature" disclosed at (column 3 lines 62-65).

Regarding claim 5, Bednarchik discloses 32° F as the predetermined threshold temperature prior to the start of the integration calculating means (column 5 lines 12-15). It is inherent that the temperature at which condensed water on a refrigerant evaporator starts freezing is approximately 32° F under normal circumstances. Only under extreme circumstances would this temperature differ and Bednarchik does state, "as applications may require, the value of the integrating start temperature may vary" (column 4 lines 61-62).

Regarding Claim 9, the control unit of Benarchik's freezing prevention system restarts the operation of the refrigerant compressor (50) at a point when the detected refrigerant evaporator temperature is higher than a predetermined re-start value (column 5 lines 35-36 and column 4 lines 43-54).

Claim(s) 10 and 11 are rejected, as Bednarchik discloses an air conditioning case (10) that defines an air passage through which air flows into a compartment (20 and 22). The condenser (54), thermal expansion valve (58), evaporator (18) and compressor (50) are configured in series, Figure 3. Thus the refrigerant is able to travel in a cycle from the compressor (50) to the condenser (54) to the expansion valve (58), where it is decompressed, and to the evaporator where it is cooled. Bednarchik discloses a refrigerant evaporator (18) with a temperature sensor (71) disposed in the refrigerant evaporator. Bednarchik further discloses a control unit (column 3 lines 54-55), with an integral calculating means (column 4 lines 43-55), that stops the operation of the compressor when the integral value calculated by the calculating means becomes equal to or larger than a predetermined value (column 4 lines 63-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim(s) 3, 4, 7, 12 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bednarchik in view of Shibata (US 2002/0170707) and Takahashi (US 6330909). The claims differ from Bednarchik in calling for an evaporator that has a plurality of tubes and a plurality of fins each of which is disposed between the tubes, and in the location of the temperature sensor on either a tube or a fin. While Bednarchik does not explicitly teach the claimed evaporator structure, it is nonetheless conventional in the art. As evidence of such, attention is drawn to the secondary reference. The Shibata reference teaches an evaporator with a plurality of flat tubes (12a) and a plurality of fins (12b) each arranged between the tubes (Figure 2). Shibata discloses flat tubes that are formed by connecting two thin metal plates so that there is a sectional flat refrigerant passage (page 2 0026). To maximize the heat transfer from the surface of the evaporator a conductive material must be used. Therefore it would have been obvious to one of ordinary skill in the art to employ the evaporator structure of Shibata in the system of Bednarchik.

Takahashi discloses a temperature sensor (32) mounted on either the fins or the tubes (93 or 94) of the evaporator (see Figure 9). Takahashi further discloses the

Art Unit: 3744

temperature sensors (33) location is for the purpose of directly detecting the refrigerant temperature (Column 21 lines 43-50). Takahashi is evidence that one of ordinary skill in the art of evaporators would recognize the importance of the most precise and quick refrigerant temperature measurements in the evaporator as ice builds quickly and it's critical that the operating temperature of an evaporator be steady. Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to place a temperature sensor on the tube or fin surfaces, at a predetermined distance from the bottom end of the refrigerant evaporator to receive the most accurate refrigerant temperature readings, quickly and thus more quickly shut off the compressor to avoid excessive drops in the evaporator temperature.

Allowable Subject Matter

Claim(s) 6, and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gene L. Bankhead whose telephone number is (571)-272-8963. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571)-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gene Bankhead
Examiner
Art Unit 3744


MELVIN JONES
PRIMARY EXAMINER